A. S. OTTO.

PACKING OF OBLONG MAGNETIC OBJECTS.

APPLICATION FILED SEPT. 16, 1914.

1,367,083.

Patented Feb. 1, 1921.

4 SHEETS—SHEET 1.

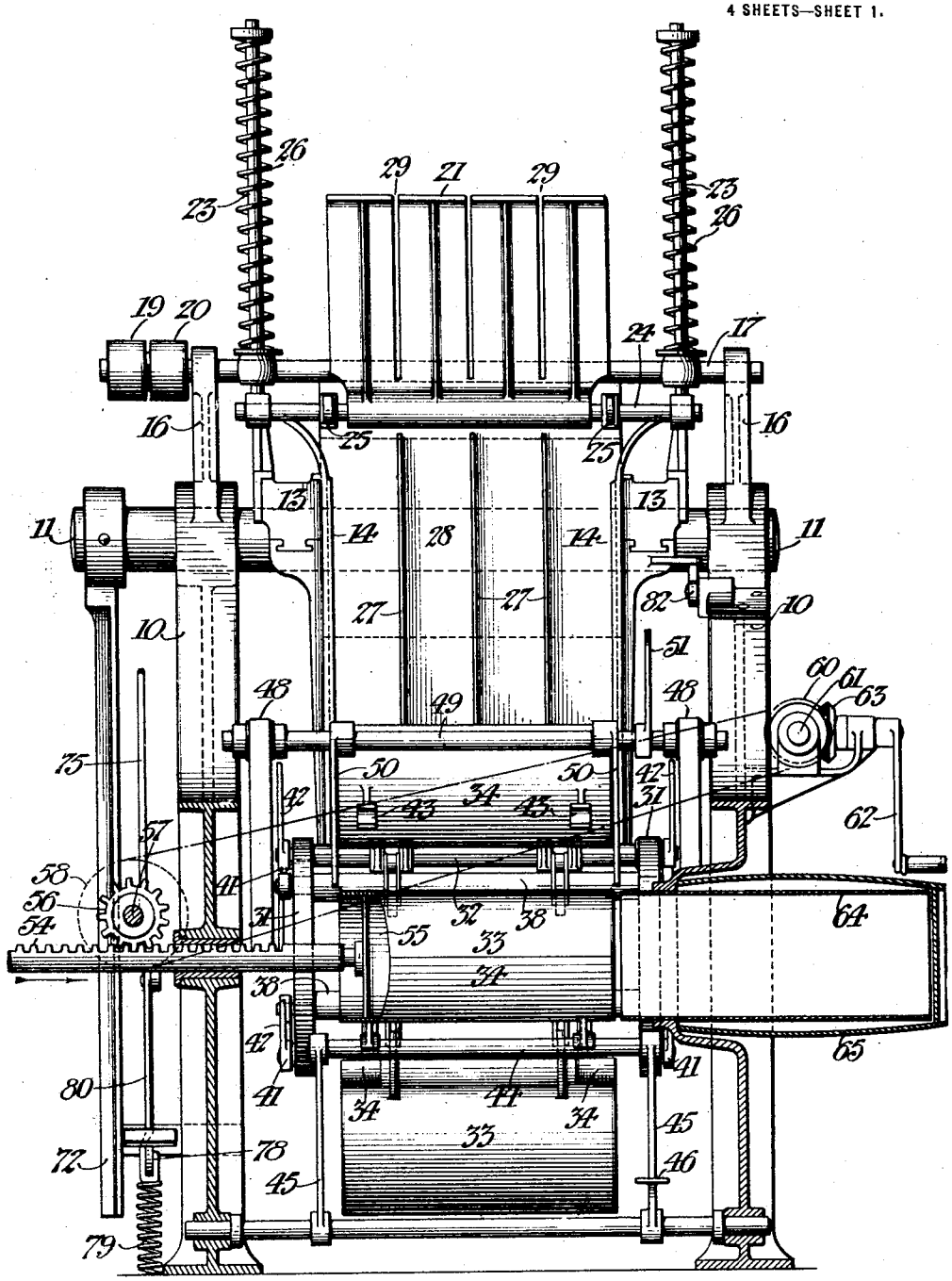


Fig. 1.

WITNESSES

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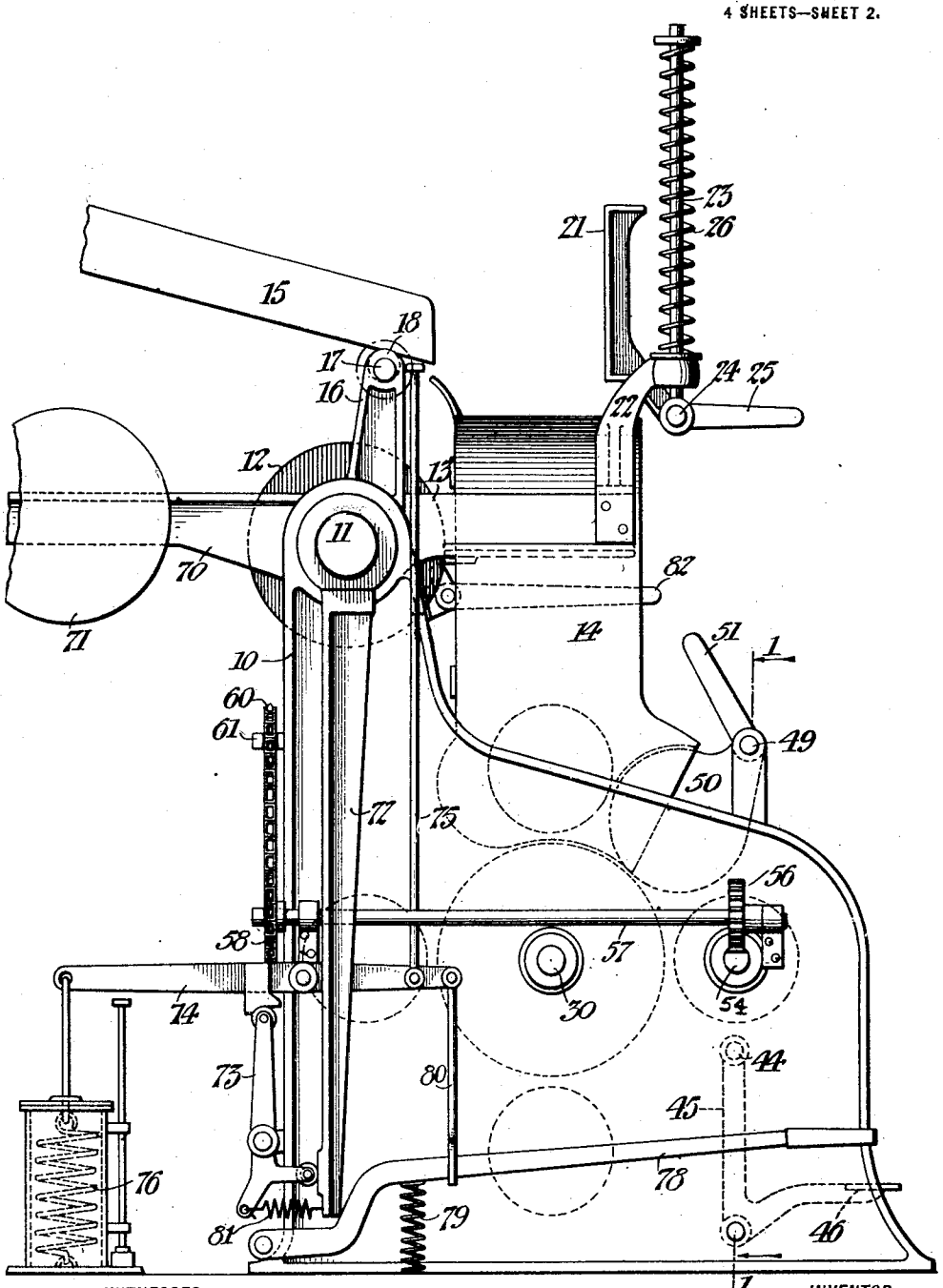
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4 SHEETS—SHEET 2.



WITNESSES

Fig. 2.

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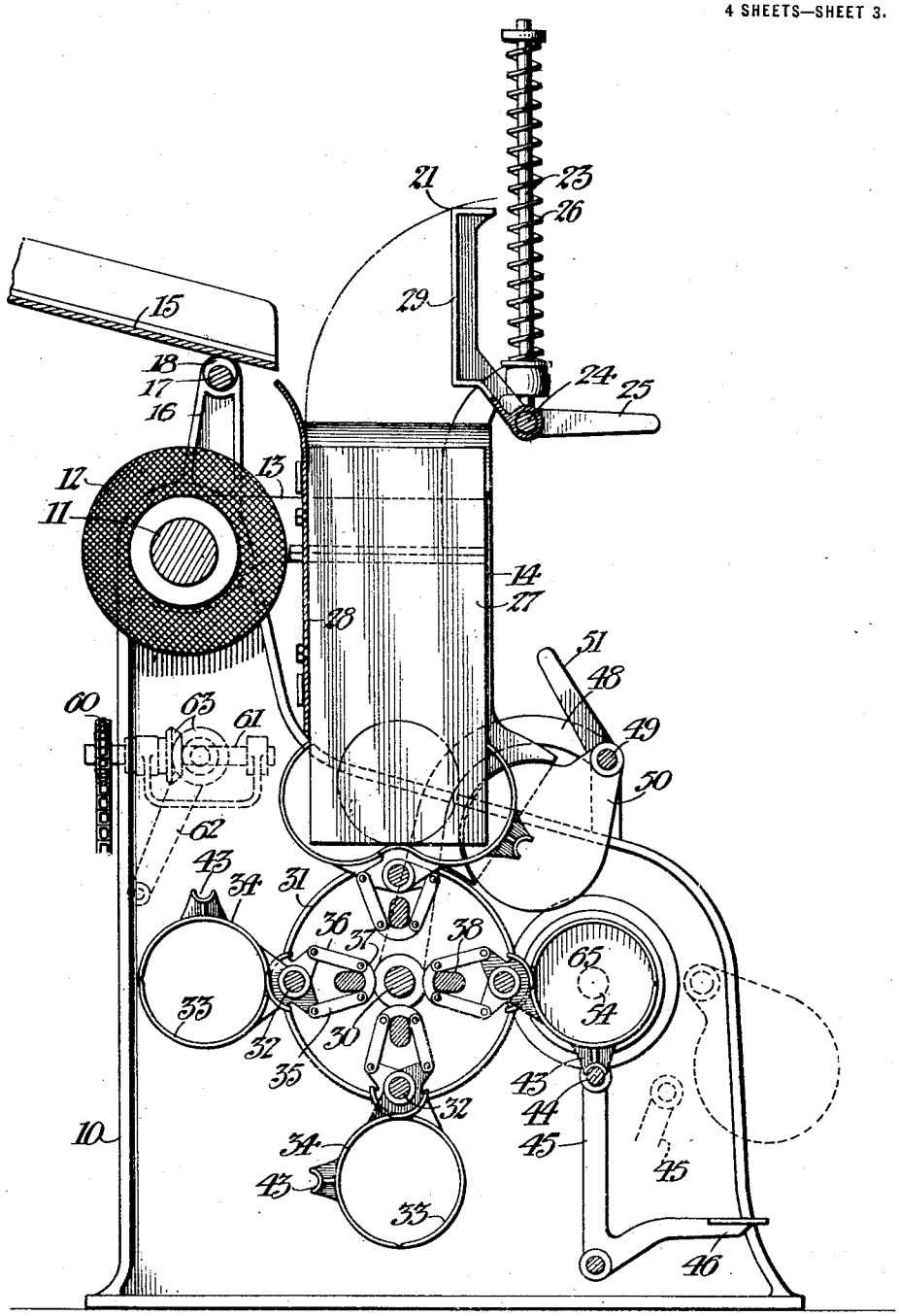
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4 SHEETS—SHEET 3.



WITNESSES

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Fig. 3.

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4 SHEETS—SHEET 4.

Fig.4.

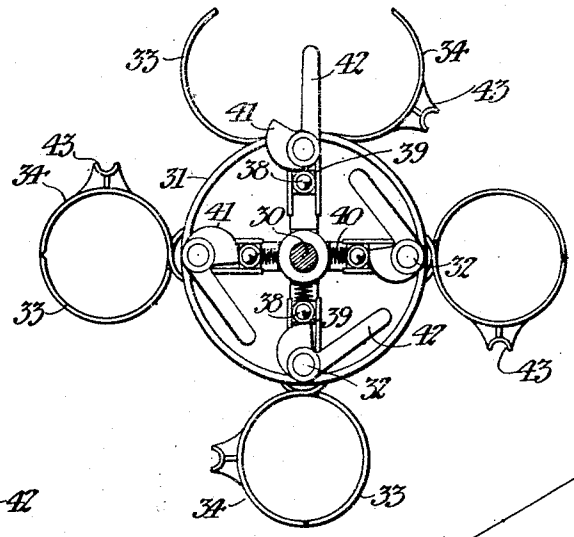


Fig.5.

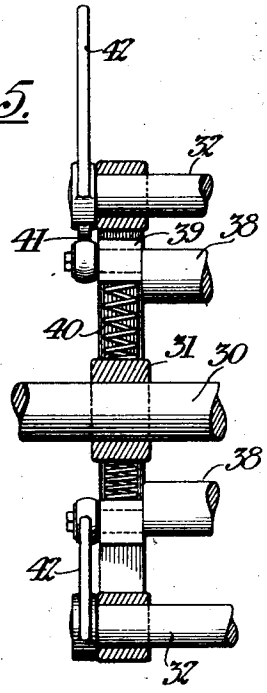
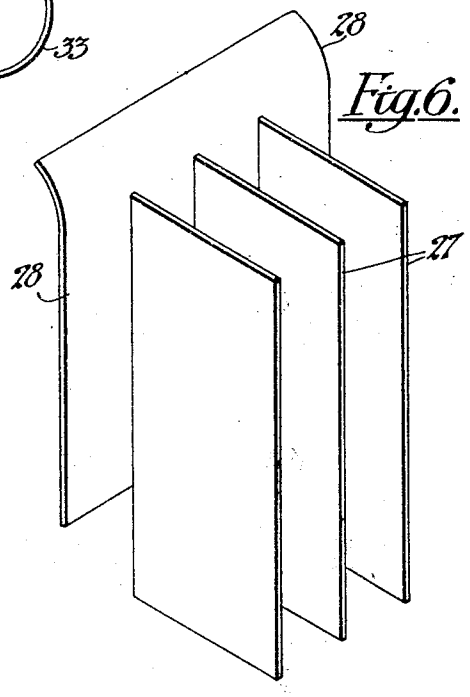


Fig.6.



WITNESSES

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UNITED STATES PATENT OFFICE.

ALBERT STUART OTTO, OF BRONXVILLE, NEW YORK.

PACKING OF OBLONG MAGNETIC OBJECTS.

1,367,083. Specification of Letters Patent. Patented Feb. 1, 1921.

Application filed September 16, 1914. Serial No. 862,025.

To all whom it may concern:

Be it known that I, ALBERT STUART OTTO, a citizen of the United States, and a resident of Bronxville, in the county of Westchester and State of New York, have invented certain new and useful Improvements in the Packing of Oblong Magnetic Objects, of which the following is a specification.

My invention relates to the packing of oblong objects of magnetic material with the objects arranged in parallelism so as to utilize to the maximum extent all of the available space within the package or container. I seek particularly to pack the objects in containers of materially greater length than the objects to be packed as distinguished from arranging them in a small carton of a length substantially equal to the length of the object. My invention may be utilized for the packing of nails, bolts, screws, and various other objects in kegs, rectangular boxes, or other containers, but for simplicity of description, I will hereinafter refer only to nails and will describe a specific form of machine particularly designed for packing in kegs, but I do not desire to be limited by such reference.

In carrying out my invention, I may perform the two steps of arranging the nails in parallelism and positioning them within the container at the same time, or the two steps may be performed in succession. For arranging the nails in parallelism, I preferably employ spaced magnetic poles between which the nails pass, so that each nail, as it falls, swings around until it lies in the same general direction as the lines of force between the poles. The space between the poles is preferably of a length substantially equal to the length of the final container, and is therefore several times greater than the length of an individual nail. When the packing and arranging are done simultaneously, I mount the container directly between the poles, so that as the nails enter the container, they will be arranged parallel. For packing in kegs, I preferably employ a form or dummy container, which may occupy a position within the lines of force while being filled and may then be moved to a second position where the nails may be transferred to the keg or other final or shipping container. If the nails are first arranged in a form and then transferred to the final container, I find that a very efficient mechanism for accomplishing this result, particularly where the final container is in the form of a keg, includes a plunger, movable endwise through the form in the direction of the length of the nails so as to transfer the entire mass of nails to the container without materially disturbing the general arrangement of the nails in parallelism.

In operating the machine, I may arrange the nails in separate courses or tiers, with the ends of the nails of one tier or course abutting those of the next course, and this may be secured by partitions parallel to the faces of the poles. The partitions, if such be employed, may be utilized only during the arranging of the nails in parallelism in the separate tiers and may be mounted merely between the poles in the magnetic field above the form.

My broad invention may be carried out in machines of various different forms as a large number of different embodiments of my invention may be readily designed. For this reason, I desire the specific construction shown in the accompanying drawings to be considered merely in an illustrative sense instead of a limiting one and desire the benefit of all modifications within the scope of the appended claims.

Reference is to be had to the accompanying drawings in which similar reference characters indicate corresponding parts in the several views and in which—

Figure 1 is a front view of the machine, parts thereof being shown in section on the line 1—1 of Fig. 2,

Fig. 2 is an end view of the machine in Fig. 1,

Fig. 3 is a central vertical section in a plane parallel to Fig. 2,

Fig. 4 is an end view of the form-supports, forms and operating mechanism for the latter,

Fig. 5 is an enlarged centrally longitudinal section of a portion of the mechanism shown in Fig. 4, and

Fig. 6 is a perspective view of the series of partitions and the back wall which carries them.

The specific embodiment of my invention which I have selected for illustration in this case includes a form or dummy container as a part of the machine and this container is so mounted that it may directly receive the nails through the open side and may be closed and moved to a second position from

which the nails may be forced out of one end into a keg by means of a plunger movable lengthwise through the dummy.

The machine as shown includes two side frame members 10 serving to support a transverse shaft or connecting member 11, constituting the core of an electromagnet and supporting the coil 12. From the core, two substantially parallel arms 13, 13, extend forwardly, substantially horizontal to constitute the two poles of the magnet. The core constitutes a pivotal support for the arms so that they are free to turn through a limited distance as will be pointed out more particularly hereinafter. The two arms carry substantially parallel, vertically disposed plates, 14, 14, constituting extensions of the faces of the poles. Each plate 14 has a facing of non-magnetic material, such for instance as brass so that although the nails will be attracted by the magnetized plates, they will slide down the brass surface by the action of gravity to the lower edge of the plates 14.

The nails are delivered to the machine through a trough or hopper 15 disposed above the space between the plates 14 and so mounted that it may be agitated to facilitate the delivery of the nails. As shown, the main frame has upwardly extending arms 16 supporting a transverse shaft 17 and the latter has one or more cams 18 serving to support the delivery end of the hopper 15. The shaft 17 may be rotated by any suitable means so that the cams will cause an agitation of the hopper. As shown, the shaft is provided with fast and loose pulleys 19 and 20 so that by shifting a driving belt from one to the other, a delivery of nails may be stopped or started. As the nails fall from the free end of the hopper, they enter the lines of force passing from one magnetic pole to the other and immediately swing around so as to lie parallel and in said lines of force. If no partitions are employed between the plates 14, some of the nails will be drawn to the side plates and slide down while others will adhere to the first ones, until the space is filled with loosely packed parallel nails.

I preferably form separate tiers or courses, each of a length substantially equal to the length of the nails, by means of partition plates 27 mounted between the plates 14, 14, and parallel to the latter, and spaced apart distances slightly in excess of the length of one of the nails. The partitions 27 may terminate above the receiver and partitions of pasteboard, or other similar inexpensive material may be placed in the receiver directly beneath the partitions 27 so that after the nails are separated into courses or tiers by the partitions 27, they will be prevented from mixing by the partitions in the receiver. Preferably, the partitions 27 extend down into the receiver and are vertically slidable and are connected together and to suitable operating mechanism so that they may be easily and quickly pulled up a limited distance until their lower ends are out of the receiver or container prior to the removal of the latter. They may be bolted to the back wall 28 of the magnetized field and the latter may be vertically slidable.

It is of course evident that the partitions, if of non-magnetic material, will not interfere with the proper flow of the lines of force from one pole to the other end and will not interfere with the proper arranging of the nails in parallel positions by the magnetic attraction. It is not essential that the lower ends of the partitions 27 correspond exactly to the outline of the receiver as the nails, having once been arranged parallel and in separate courses, will retain that relative arrangement when forced down into the receiver as hereinafter described. If separate partitions be employed in the receiver, it is evident that they may remain therein if the receiver be the final container or they may be transferred directly into the keg with the nails if the receiver be merely a dummy or a form. In fact they may facilitate such transfer by preventing nails from sliding endwise relative to each other and thus preventing any tendency of the nails to wedge during endwise movement.

After the desired quantity of nails have been arranged parallel in the magnetic field, it is next necessary to pack them in the receiver. Under some conditions, this may be accomplished by placing the receiver below the magnetic field and deënergizing the magnet to permit the nails to drop. Preferably a packing member or plunger is employed for forcing them down from their loosely arranged positions substantially simultaneously with the opening of any suitable kind of switch for breaking of the current. The receiver, irrespective of whether it be a form or dummy or the final container, may be placed wholly below, wholly within or partly within and partly below the magnetic field, although preferably a relatively large part of the receiver is in the lower part of the field.

As shown, the magnetized plates 14 extend downwardly for a considerable distance from the arms and their lower portions come opposite to the ends of the receiver to which it is desired to deliver the nails. For forcing the nails downwardly and packing them together in the receiver, I provide a plunger so mounted that it may normally lie out of the path of the nails, but may be swung into position between the plates and then forced downwardly to sweep the nails off the plates 14 and bring them into compact form. As shown, the outer ends of the two

arms 13, 13, are provided with brackets 22 and each bracket supports a vertically sliding rod 23. The two rods 23 are connected together at their lower ends by a transverse rod 24 which carries the plunger 21. This plunger is of a length substantially equal to the distance between the two plates 14, 14, and is of a width substantially equal to the width of said plates. It normally occupies a vertically disposed position substantially as shown in Fig. 2 but by means of a handle 25, an operator may first swing it about the rod 24 as an axis so that it will lie in a substantially horizontal position above the top of the mass of nails between the two magnets and may then force it straight downwardly as the rods 23 slide through the brackets 22. Suitable coil springs 26 normally hold the plunger in its raised position.

If no partitions be employed in the magnetic field, the plunger may be in the form of a single plate, but where partitions are employed, the plunger is sub-divided into sections or is provided with slots 29 through which the partitions may pass as the plunger is moved downwardly.

I may, and for present purposes do, prefer to first pack the nails in a form of a length and diameter approximating that of the keg and then transfer the nails as a whole to the latter. If a form be employed, I preferably provide a plurality so that while one is being filled, another may be emptied.

In the specific construction illustrated, I mount a plurality of forms so as to move in succession along a predetermined path, passing through a filling position and a discharging position. They may be carried by a main, transversely extending, supporting shaft 30 having spiders or frame members 31 rigidly secured thereto at opposite ends. These frame members 31 are connected together by a plurality of shafts 32 substantially parallel to the main or central shaft 30 and free to revolve about the latter as an axis. Each shaft 32 carries a form or dummy container and each of these forms or containers includes two substantially semi-cylindrical wall sections 33 and 34 pivotally mounted on their respective shafts 32. Operating mechanism is provided whereby the edges of the two sections opposite to the shaft 32 may be spread apart to a distance substantially equal to the width of the magnetic field or may be brought together to form a substantially cylindrical tube. This may be accomplished in various different ways, but as shown, I provide the two sections 33 and 34 with one or more pairs of links 35 and 36, the links of each pair being connected together, as for instance, by a transverse link 37. By moving the link 37 toward or from the shaft 30, the two sections 33 and 34 may be caused to swing about the shaft 32 as an axis. For moving the link 37 I provide a bar 38 extending substantially parallel to the shaft 30 and having its ends mounted in the two frames 31, 31. As shown, the two ends of the rod 38 are carried by sliding blocks 39 movable radially of the frames 31 and normally held in their outward limiting position by springs 40.

In operation, the bars 38 are permitted to move to their outer position and thus permit the separation of the sections 33 and 34, when the latter are directed beneath the magnetic field. After the form has been filled with nails forced downwardly by the plunger 21, the sections 33 and 34 are brought together so as to form a tube and the shaft 30 is rotated one-quarter revolution to bring the loaded form away from the magnetic field and to bring a second form into position ready to be filled. Any suitable mechanism may be provided for moving the bars 38 inwardly. As shown, each shaft 32 is rotatable and provided with a cam 41 which engages with its bar 38 to force the latter inward when said shaft is rotated. A rigid or removable handle 42 may be used to rotate the shafts.

To limit each partial revolution of the shaft 30 and the resulting bodily movement of the forms, I may provide each section 34 with a seat 43 adapted to engage with a support 44. This support may be in the form of a rod at the upper end of two pivotally mounted arms 45 and a foot pedal 46 may be employed for moving the support into or out of the path of the movable forms.

With the support 44 in the position shown in Fig. 3, the shaft 30 and the forms carried thereby may be rotated until the seat 43 comes into engagement with the support. At this time, the next successive form will have been brought to proper operative position for filling. When it is desired to further rotate the shaft and forms, the foot pedal 46 may be moved down to swing the support over to the position shown in dotted lines in Fig. 3 and thus out of the path of the forms.

If a final container be placed directly in the magnetic field it may have its own end walls but where a form is used, its ends may be closed by the plates 14 while the form is being filled. Suitable end walls may be provided for preventing the nails from falling out of the ends of the form while it is being moved from the filling to the discharging position. In practice, if the nails are properly stacked in courses or tiers and in proper parallel positions within the form, there is very little danger of the nails falling out of the end during the swinging movement of the form, but the end walls are needed if for any reason any of the

nails at the end of the form are not properly positioned.

As shown, the shaft 30 has two arms 48, 48, pivotally mounted thereon adjacent to the opposite ends and the two arms are connected by a transverse rod 49. Rigidly secured to this rod are two plates 50 spaced apart a distance equal to the length of the form, and each of a diameter slightly greater than that of the form. The arms 48, when in their upward limiting position, permit the end walls 50 to be moved to the position shown in solid lines in Fig. 3 with their edges lying in shallow recesses in the faces of the plates 14, 14. As the form moves forwardly and downwardly about the shaft 30 as a center, it comes opposite to the end walls 50, 50, as it leaves the plates 14, 14. The end walls 50 may then move along with the form so as to close the ends of the latter until the form has moved through one-quarter revolution and rests upon the support 44. The end walls 50, 50, may then be swung about the shaft 49 as a center and to the position shown in dotted lines at the lower right hand corner of Fig. 3.

For facilitating the swinging of the arms 48 and the swinging of the end walls 50 about the shaft 49 as a center, the latter may be provided with a handle 51 rigidly secured to the shaft and movable bodily with the latter, and with the end walls.

For removing the nails from the form and transferring them to a keg, or other container, I preferably provide a plunger so mounted as to operate lengthwise through the form after the latter has moved to the discharging position and after the end walls 50, 50 have been swung to inoperative positions. As shown, one of the frame members 10 carries a plunger rod 54 having upon its end a plunger 55, the diameter of which is slightly less than the diameter of the form. Any suitable means may be provided for forcing the plunger and plunger rod endwise through the form. As shown, the plunger rod itself is provided with rack teeth engaging with a rack pinion 56 and the latter is mounted on a shaft 57 which may be rotated by a sprocket 58. A chain 59 extends across the back of the machine from the sprocket 58 to a driving sprocket 60 mounted on a shaft 61. The latter may be rotated by a hand crank 62 and bevel pinions 63, or a small electric motor may be employed as the source of power, or the shaft 57 may be belted up and driven from the same source of power as the shaft 17.

At the side of the machine opposite to the plunger the other frame member 10 carries a sleeve 64 of a length substantially equal to the length of the form and also substantially equal to the length of a keg 65 into which it is desired to deliver the nails. The sleeve is supported solely at one end so that a keg may be slipped on over the outer end of the sleeve as is shown in Fig. 1. The sleeve is of substantially the same diameter as the form and is so positioned that when the form is in its discharging position, it will come opposite to and in alinement with the sleeve. If desired, the sleeve may have a limited endwise movement in the frame member or the form may have a limited endwise movement so that the two may directly abut when in alinement and after the end walls 50 have been swung to inoperative position. With the parts in this position, the crank 62 may be turned and the plunger caused to force the entire mass of nails endwise out of the form and into the sleeve. As the plunger continues to move, the nails will be forced out of the sleeve and will abut against the end of the keg so as to force the latter off of the sleeve and at the same time transfer the nails into the keg. As the plunger reaches the outer end of the sleeve, all of the nails will have been transferred to the keg and will still remain in their parallel relationship, and will extend lengthwise of the keg so as to fill all of the available space of the latter. While the nails are being forced out of one form and through the sleeve into the keg, a second form will be in position below the magnetic field and will be receiving nails. The operation of arranging the nails parallel and placing them in one form will thus be carried on simultaneously with the transferring of the nails from the previously filled form to the final container.

In order to automatically stop the machine when a sufficient quantity of nails have been collected in the magnetic field, and to thus prevent the accumulation of more nails in the field than will go into a form, I provide a suitable automatic weighing mechanism, one embodiment of which is shown particularly in Fig. 2. As previously stated, the magnetic poles and the plates 14, 14, are free to move vertically to a limited extent and about the core 11 as an axis. As shown, an arm 70 extends rearwardly from the core and carries a counterbalancing weight 71 which holds the parts substantially in the position shown in Fig. 2. Rigid with the arm 70 and the poles, is a depending lever arm 72, the lower end of which engages with one arm of a bell-crank lever 73. The upwardly extending arm of the bell-crank lever serves as a support for one end of a lever 74 which is pivoted on the frame. The lever 74 has a rod 75 extending upwardly to a position closely adjacent to the hopper 15 and has its opposite end connected to a heavy coil spring 76. As the weight of the nails, which have accumulated in the magnetic field and which are supported by the magnet, reaches a

predetermined amount, the effect of the counter-balancing weight is overcome and the arms 13 swing downwardly to a slight extent. This causes a rearward movement of the lower end of the lever arm 72 and causes the lever 73 to swing out from beneath its seat on the lever 74. The spring 76, or an equivalent weight, can then pull down the rear end of the lever 74 and the rod 75 will then rise to lift the hopper off the cam and thus stop the agitation of the hopper and stop the delivery of nails. At this time, the magnet may be deënergized in any suitable manner as for instance by opening a switch of the usual electric circuit which includes the coils of the magnet, and the plunger 21 may be swung over into operative position and lowered to force all the nails into the form. As soon as the nails are forced into the form and the magnet is relieved of the weight of the nails, the magnets will again rise and swing the lever arm 72 back to the position shown in Fig. 2. For restoring the other parts, I may provide a foot pedal 78 normally held in a raised position by the spring 79 and having a link 80 connected to the lever 74. By pressing down on the foot pedal, the rod 75 will be lowered, the spring 76 will be extended, and the seat on the lever 74 raised so that a spring 81 may pull the lever 73 back to the position illustrated. It is of course evident that the vertical movement of the magnets is very small as the lever 72 is long and it is only necessary to swing the lower end of the lever a very short distance to effect the desired operation. The circuit through the coil of electromagnet is ordinarily broken just prior to attempting to force the nails down from the magnetic field into the form, so that the residual magnetism will aid in holding the nails in proper parallelism while the latter are being forced into the form.

Any suitable means may be provided for limiting the extent of swinging movement of the arms 13. As shown, I provide a lever 82 pivotally mounted on the frame and having one end which may be brought into supporting position beneath one of the arms. As illustrated, the shaft 11 is cylindrical throughout its length and particularly in the bearings. It is of course evident that the accuracy of the weighing mechanism will vary with the resistance to swinging movement of the parts supported by the shaft 11. To make the weighing mechanism more delicate, it is of course evident that the portions of the shaft 11, which extend throughout the supporting frames, may present a comparatively sharp supporting edge resting upon a plate in the bearing as is common in various forms of weighing mechanism. Instead of a knife edge of this character, the provision of ball bearings may make the device sufficiently accurate for ordinary purposes.

As previously stated, many changes may be made in the construction of the machine illustrated without departing from the spirit of my invention as defined in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A machine for packing nails including a pair of spaced, magnetic poles, a plurality of partitions therebetween sub-dividing the magnetic field into passages and means for supporting a receiver within said magnetic fields and with an opening communicating with all of said passages.

2. A machine for packing nails including spaced, magnetic poles, a plurality of partitions therebetween sub-dividing the magnetic field into compartments, and means for supporting a receiver with its open side communicating with all of said compartments.

3. A machine for packing nails including spaced magnetic poles, means for delivering nails to the magnetic field therebetween, whereby said nails are drawn to positions in parallelism, a series of receivers, and means for moving said receivers in succession into and out of said magnetic field.

4. A machine for packing nails including spaced magnetic poles, means for delivering nails to the magnetic field therebetween, whereby said nails are drawn to positions in parallelism, a series of receivers, means for moving said receivers in succession into and out of said magnetic field, and means for discharging the contents of one receiver at a point out of said magnetic field while another receiver is being filled within said magnetic field.

5. A machine for packing nails including a series of receivers bodily movable along a predetermined path, a pair of magnetic poles spaced apart to form a magnetic field within a portion of said path, means for delivering nails to said magnetic field to fill a receiver when the latter is within the field, and discharge mechanism at another point along the path.

6. A machine for packing nails including a series of receivers bodily movable along a predetermined path, magnetic poles spaced apart to form a magnetic field within a portion of said path, means for delivering nails to said magnetic field to fill a receiver when the latter is within the field, and discharge mechanism at another point along the path, said discharge mechanism including a plunger movable lengthwise of the receiver.

7. A machine for packing nails including a series of receivers bodily movable along a predetermined path, magnetic poles spaced

apart to form a magnetic field within a portion of said path, means for delivering nails to said magnetic field to fill a receiver when the latter is within the field, and discharge mechanism including a plunger movable lengthwise of the receiver and in the direction of the length of the nails within the latter.

8. A machine for packing nails including a plurality of receivers movable along a predetermined path, means for opening each receiver along the upper side thereof when at one position in said path, means for delivering nails arranged in parallelism to said receiver when at said last mentioned point, means for closing the receiver, and means for discharging the contents of said receiver axially of the receiver without opening the latter when at another point along said path.

9. In combination, an open ended, substantially cylindrical sleeve adapted to be received within a keg of approximately the same general size and proportions, means for filling nails into a form of substantially the same general size and proportions as said sleeve, means for moving said form into alinement with said sleeve, and means for transferring nails from said form through said sleeve into said keg.

10. In combination, an open ended, substantially cylindrical sleeve adapted to be received within a keg of approximately the same general size and proportions, means for filling nails into a form of substantially the same general size and proportions as said sleeve, means for moving said form into alinement with said sleeve, and means for transferring nails from said form through said sleeve into said keg.

11. In combination, a shaft, a frame carried thereby, a plurality of receivers carried by said frame and each including a plurality of relatively movable sections whereby the container may be opened or closed along a line substantially parallel to said shaft, means for delivering nails to said receiver through the peripheral side of the latter with the nails arranged in parallelism and substantially parallel to said shaft, means for closing the receiver, means for bodily moving the receiver about said shaft as a center, and a plunger movable endwise through the receiver to discharge the nails from the latter.

12. In combination, a shaft, a frame carried thereby, a plurality of receivers supported by said frame and movable bodily about said shaft, each of said receivers including a plurality of pivotally connected sections, whereby the side of the receiver may be opened to receive nails, and means for delivering nails to said receivers substantially in parallelism and extending in the same general direction as the length of the receiver, said means including a magnet having its poles spaced apart a distance substantially equal to the length of the receiver.

13. In combination, a series of bodily movable, open-ended receivers, end walls between which said receivers pass during the filling operation, and a plunger movable endwise through each receiver in succession after it passes beyond said stationary walls.

14. In combination, an open-ended, substantially cylindrical receiver formed of relatively movable sections whereby material may be filled into the receiver through the side thereof, separate end walls between which said receiver may pass, and a plunger beyond said walls and movable through the receiver to discharge the contents thereof.

15. In combination, a substantially cylindrical, open-ended receiver, means for opening and closing the side thereof, means for arranging nails in parallelism and delivering the same through said open side, said means including a magnet having plates serving as end walls opposite poles, and means for discharging the contents of said receiver.

16. In combination, a substantially cylindrical, open-ended receiver, means for opening and closing the side thereof, means for arranging nails in parallelism and delivering the same through said open side, and means for discharging the contents of said receiver after the latter moves out from between said walls.

17. A machine for filling nails into kegs, including a pair of oppositely magnetized plates spaced apart a distance substantially equal to the length of the keg, a receiver between said plates adapted to receive the nails in parallelism and extending in the same general direction as the length of the receiver, and means for transferring the contents of the receiver bodily into the keg.

18. A machine for packing nails including a pair of oppositely magnetized plates spaced apart to a distance substantially equal to the length of the container to be filled, and a series of partitions between said plates and spaced apart to distances substantially equal to the length of individual nails.

19. A machine for packing nails including means for forming a magnetic field sub-divided into compartments, each of a length substantially equal to the length of a nail, and means for simultaneously transferring the nails from each of said compartments to the receiving means.

20. A machine for packing nails including a magnetic field, sub-divided into a plurality of compartments each of a length substantially equal to the length of a nail to be packed by the machine, a receiving means supported in the lower portion of said field, and a plurality of plunger members movable simultaneously through the

several compartments to transfer the nails from the latter to the receiving means.

21. A machine for packing nails including a magnetic field, a plurality of partitions within said field and sub-dividing the latter into compartments, the distance between said partitions being slightly greater than the length of a nail, and a plunger having a plurality of sections each movable through a corresponding compartment to transfer the nails from the latter to a receiving means.

22. A machine for packing nails comprising a plurality of substantially horizontal, parallel arms constituting the poles of an electromagnet presenting magnetized plates and depending therefrom, and a receiver between said plates and said plates constituting the opposite ends thereof.

23. A machine for packing nails comprising a pair of oppositely magnetized poles, means for delivering nails to the magnetic field therebetween, a pivoted plunger normally disposed out of the field and movable about its pivotal support to a position above the field and slidable with the pivotal support through said field.

24. In combination, a pair of oppositely magnetized poles, means for delivering nails into the magnetic field therebetween, whereby the nails are arranged parallel and are supported by said poles, and means for automatically stopping the delivery of nails upon the accumulation of a predetermined mass of nails.

25. In combination, an electromagnet, means for delivering nails to the vicinity thereof whereby said nails are arranged parallel, and automatic means for stopping the delivery actuated by the accumulation of a predetermined mass of nails.

26. In combination, an electromagnet, vibratory means for delivering nails to the vicinity thereof, whereby said nails are arranged parallel, and means for automatically stopping the vibration of said delivering means actuated by the accumulation of a predetermined mass of nails.

27. A machine for packing nails including a delivery member, means for vibrating the latter, movable means for receiving and supporting said nails, and means controlled by said receiving and supporting means for rendering inoperative said vibrating means upon the accumulation of a predetermined weight of nails.

28. A machine for packing nails including a delivery member, means for vibrating the latter, pivoted means for receiving and supporting said nails, and means controlled by said receiving and supporting means for rendering inoperative said vibrating means upon the accumulation of a predetermined mass of nails.

29. A machine for packing nails including a delivery chute, a cam for vibrating said chute, pivotally supported means for receiving and supporting the nails, connections to said receiver and supporting means, and means controlled by said connection for automatically disengaging said cam and chute upon the accumulation of a predetermined weight of nails.

30. A machine for arranging nails in parallelism, including two spaced poles forming therebetween a magnetic field of a strength to support a predetermined quantity of nails, and means operated by the weight of the nails for breaking the lines of force when nails exceeding a predetermined weight have accumulated within said field.

31. A machine for arranging nails in parallelism, including an electromagnet having a pair of magnetic poles, a pair of substantially vertical, spaced plates therebetween and defining the magnetic field open at the top, means for delivering nails into said field at the upper end, and means for stopping the delivery of nails to said field, said means being automatically operated by the accumulation of a predetermined quantity therein.

32. A machine for arranging nails in parallelism, including an electromagnet having spaced, substantially parallel poles forming a magnetic-field therebetween, a source of power, means operated from said source of power for delivering nails to said field, and a movable member within said field for mechanically transferring the nails to a predetermined portion of the field after they have been drawn into parallelism with the lines of force.

33. A machine of the class described, including means for forming a magnetic field, and walls defining said field, said walls including two substantially parallel walls spaced apart to a distance greater than the length of the nails and a downwardly extending wall.

34. A machine of the class described, including means for forming a magnetic field, substantially parallel walls defining said field, and mechanical means for moving the nails within said field to a position from which they may move out of the field.

35. A machine for arranging nails in parallelism, including two spaced poles forming between themselves a magnetic field, means for delivering magnetic objects into the said field, and means movable through said field and adapted to bring the said magnetic objects in compact form and simultaneously remove the same from the field.

36. A machine for packing magnetic objects, including a magnetic field, a plurality of partitions in said field and sub-dividing

the latter into compartments, and a plunger having a plurality of members each movable through a corresponding compartment to transfer the said objects from the latter into container means.

37. A machine for packing magnetic objects, including means for forming a magnetic field sub-divided into compartments in which the objects delivered become arranged in tiers and in parallelism, and means for simultaneously removing the objects from the different tiers into container means.

Signed at New York city, in the county of New York, and State of New York, this 15th day of September, A. D. 1914.

ALBERT STUART OTTO.

Witnesses:
C. W. FAIRBANK,
FLORENCE LEVIEN.